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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Noriko Nagahori

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SEED INTELLECTUAL PROPERTY LAW GROUP PLLC

701 FIFTH AVE

SUITE 5400

SEATTLE, WA 98104

EXAMINER

XU, XIAOYUN

ART UNIT

PAPER NUMBER

1777

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/594,848	Applicant(s) NAGAHORI ET AL.	
	Examiner ROBERT XU	Art Unit 1777	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 1-3,5-12,14 and 17-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4,13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 02/15/2011 has been entered and fully considered. Claims 1-30 are pending, claims 1-3, 5-12, 14 and 17-30 have been withdrawn from consideration. Claims 4, 13, 15 and 16 are considered on merits, of which Claims 4, 13, 15 and 16 are amended.

Response to Amendment

2. In response to amendment, the examiner maintains rejection over the prior art established in the previous Office action.

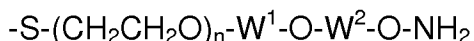
Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claim 4 and 13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 2005/0074551) (Huang) in view of Hutchens et al. (WO 98/59362) (Hutchens).

In regard to claims 4 and 13, Huang teaches a method for trapping a biological molecule specifically for analysis (see paragraph [0006]). The method comprises:

1) contacting a metal-organic residue complex with a biological molecule under conditions where the metal-organic residue complex and the biomolecule react with each other. Huang teaches sulfhydryl (-SH) functional group that links the binding of the organic residue to gold and other metals (see paragraph [0064]). Huang teaches a sulfhydryl group for two of the preferred short chain ethylene glycol oligomers, EG2-SH and EG4-SH (see paragraph [0075]). Huang teaches that the organic residue may be functionalized with -NH₂ for binding to a biomolecule (see paragraph [0073]). Therefore, Huang teaches that the metal-organic residue complex contains a metal bound to a group by the following formula (see paragraph [0064], [0073], [0075], [0076]):



wherein,

W^1 is ethylene, W^2 is ethylene, n is 2.

Huang also teaches 2) obtaining the metal-organic residue complex bound to the biomolecule (see paragraph [0083]). Huang does not specifically teach that the biomolecule can be a sugar chain or a sugar chain-containing molecule. However, using metal-organic residue complex to trap a sugar chain or a sugar chain-containing molecule is known in the art. Hutches teaches metal-organic residue complex composed of sulfur (-S-) linking functionalized polyethylene glycol $-(CH_2CH_2O)_n$ to metal ion and using the metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties (see page 28, lines 4-6; page 39, lines 22-24, lines 29-31; page 41, lines 14-16, 18-20). Hutches teaches that the other end of the linker generally has an amino functionality $(-NH_2)$ (see page 27, line 31). Huang and Hutches are analogous because both are directed to metal-organic residue complex. At time of the invention it would have been obvious to one of ordinary skill in the art to use Hung's metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties as taught by Hutches, because glycoproteins with surface exposed hydrophilic sugar are biomolecules and react with Hung's metal-organic residue complex.

Hutches teaches 3) ionizing the metal-organic residue complex bound to the sugar chain of sugar chain-containing substance into sulfur atom-containing derivatives of the organic residue by laser beam (Matrix-assisted laser desorption/ionization, or MALDI) (see page 34, lines 32-33). Since Huang and Hutches disclose the same metal-organic residue complex and Hutches uses the same metal-organic residue complex for ionization by a laser beam, it is inherent that the same metal, such as gold as a preferred embodiment of Huang (see Figure 1) and Hutches (see page 27, line 27), should have a surface which **enables** diffuse reflection of a laser beam.

5. **Claim 15 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Hutchens in view of Lambert et al (US 4,511,658) (Lambert)

In regard to claims 15 and 16, Hutchens teaches metal-organic residue complex composed of sulfur linking organic reagent to metal ion and using the reagent of the

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metal-organic residue complex for trapping glycoproteins with surface exposed hydrophilic sugar moieties (see page 28, lines 4-6; page 39, lines 22-24, lines 29-31; page 41, lines 14-16, 18-20). Hutchens does not teach 4-amino-3-hydrazino-5-mercapto-1,2,4-triazole (AHMT) recited in the instant claims. However, AHMT is a well-known reagent for reacting with ketones and aldehydes. For example, Lambert has demonstrated the AHMT reacts with ketone (acetone) and aldehyde (formaldehyde) (see col. 3 to col. 4). Lambert further teaches that the concentration of formaldehyde can be detected in the range from 0.2 to 2 ppm (see col. 4, lines 9-11). It is well known that glucose is typical of the structure of monosaccharides. Hydroxyl groups (-OH) are attached to all carbons except one. The carbon without an attached hydroxyl group is double-bonded to oxygen to form what is known as a carbonyl group. The location of this group determines whether or not a sugar is known as a ketone or an aldehyde sugar. If the group is not terminal then the sugar is known as a ketone. If the group is at the end, it is known as an aldehyde. Therefore, at time of the invention it would have been obvious to one of ordinary skill in the art to use metal linked AHMT to detect sugar moieties containing ketone or aldehyde, because Lambert teaches that AHMT can detect aldehyde as low as 0.2 ppm.

Response to Arguments

6. Applicant's arguments filed 02/15/2011 have been fully considered but they are not persuasive.

Applicant argues that *"in no instance does Huang teach or suggest a sugar chain or sugar chain-containing substance attached to a metal comprising a surface which enables a diffuse reflection of a laser beam or that the same can be analyzed by mass spectrometry at such increased sensitivity"* (remark, page 24). In response, Hutches teaches 3) ionizing the metal-organic residue complex bound to the sugar chain of sugar chain-containing substance into sulfur atom-containing derivatives of the organic residue by laser beam (Matrix-assisted laser desorption/ionization, or MALDI) (see page 34, lines 32-33). Since Huang and Hutches disclose the same metal-organic residue complex and Hutches uses the same metal-organic residue complex for ionization by a

laser beam, it is inherent that the same metal, such as gold as a preferred embodiment of Huang (see Figure 1) and Hutches (see page 27, line 27), should have a surface which **enables** diffuse reflection of a laser beam.

Applicant submits that “*substrates disclosed by Hutchens include strips, plates and substrates removably insertable into a detector. This is in stark contrast to the recited methods wherein the sugar chain or sugar chain-containing substance is attached to a metal comprising a surface which enables diffuse reflection of a laser beam (e.g., fine metal particles, see specification at page 37, line 27 to page 38, line 2), and the mass spectrometric analysis is performed on a solution comprising the metal, rather than a fixed array (specification at page 31, lines 3-4)*” (remark, page 25, 1st paragraph). In response, it is noted that the features upon which applicant relies (i.e., the mass spectrometric analysis is performed on a solution comprising the metal, rather than a fixed array) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT XU whose telephone number is (571)270-5560. The examiner can normally be reached on Mon-Thur 7:30am-5:00pm, Fri 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

3/1/2011

/Yelena G. Gakh/
Primary Examiner, Art Unit 1777

RX